



8/25
DISCUSSION QUESTIONS
SESSION # 2

IS THERE REASON THE
CLO4 IS READ AT RT UNDER
9min Putting THE PEAK
AT THE TAIL OF INTERFERING
IONS.

What is the status of plant uptake
& food-chain transport studies?

Where do amphibian studies fit in.

Dr. Porter

What is the time frame for the studies you are conducting.

Question for Jim Hurley

What is the scale of the different treatment technologies discussed? He mentioned the Aerojet system at 500 gpm. Are other technologies at a similar level or are they still in development?

Ron Porter

K Mayer notes

Q - when will tests be done?
- very soon.
Lettuce - 28 day
earthworm 14 day

Jim Hurley

Q - Costs of bioreactor seems high relative to typical drinking water treatment costs
- Reluctant to talk about costs
- Yes, we are not there yet in costs, but very quickly reducing costs that might be used for potable water
Remember, strategy is specific to particular situation.
- Treatment ~~is~~ not necessarily for drinking water

Q. - Scale of Aerjet bioreactor is at 500 gpm?
are any other technologies at this scale

A - Not yet, but moving rapidly. per

Cornell Long - pm

Kevin Mayer Notes

Q - To what extent do you (Cornell) expect the binder to have ~~an~~ effect?

Ray Lehr at U.Tex. -

Mostly soluble

Poly Butyl Diene
poly butyl diene

A - When rocket is burned, may have some residual, but mostly when rocket fuel is removed in aqueous solution.

Q - Synergistic Effects with metals (alluminum or naturally occurring)?

- not considering synergistic effect yet.

Q - Effect of humic acids on fate & transport in soil
Ray Lehr mentions effect of clay and organics, effect of ion-exchange capacity in soil.

Q - More mobile in lake shore sediments than in soil, gw solids
- maybe some more interactions (large IT)

Q to Dr. Tsui: Retention time less than 9 minutes - lots of interference that early?

- lots of IC instruments

DX 3² has retention time of 3 minutes

DX ?

DX 500 - newest

9 minutes

Ron Porter

Q - Why did NASA fund crops studies?

Possibly disposing as ammonium fertilizer

Q - Much evidence of plant uptake and food chain transport?
- not much but there may be. Analytical methods for tissues are still developing.
- C14 may break down in plants?

Analysis
Q Effect of filtering water samples? K Mayer notes:
- no studies

Q - Organic chemicals can interfere w. ClO_4^- org?
- yes, BTEX methanol

Q. Method Detection Limit vs. method practical quantitation limit
PQL - 2 to 10x noise, depends on labs.

Q Saline and brackish environment
very high TDS and Electroconductivity
17,000 $\mu\text{S}/\text{cm}$ ($\approx 17,000$)
with increasing dilution, the perchlorate
peak gets higher and higher.

Somewhat - method needs sample prep at high TDS
(ion exchange, filtration)
↑

Q. - Stability of samples - is it done in reagent water
natural water sampled in co-labs
showed stability over 4 weeks (30 days)
(see handout)

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ANNE,

IT WAS SUGGESTED THAT INHALATION DOSE THROUGH SHOWERS IS NOT
A SIGNIFICANT ISSUE. HOWEVER, IS THERE ANY CONSIDERATION OF
THE ACCUMULATION OF PERCHLORATE ON ^{EVAPORATIVE} ~~SWAMP~~ COOLER PADS (SWAMP COOLERS)
IN WHICH THE HOMEOWNER COULD BREATHE IN THE ~~HAZARD~~ DUST?
MY QUESTION IS BASED ON ^{SOME FINDINGS} ~~THE~~ THAT EVAPORATIVE COOLERS ACCUMULATE
CHLORIDE/SALT RESIDUE AND ~~THE~~ WITHOUT PERIODIC CHANGES IN THE
PADS - THE ^{FINE} DUST HAS BEEN FOUND TO "BLOW" INTO PEOPLE'S HOMES.

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Not inhalation via vapor but because
of aerolization from shower head.
swim → mucus mem is nasal → lung
if anyway gets to lung → blood
What adverse effects on lung (ex: Clara
cells
mucus ciliary
escator)

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WHAT EFFECT DOES THE DISCOVERY OF NDMA
~~HAVE~~ IN GROUNDWATER CONTAMINATED WITH
PERCHLORATE HAVE ON SUPERFUND SITE
CLEAN-UP? (i.e. RANCO CORDOVA
AND THE SAN GABRIEL VALLEY)

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① You never told us how to avoid or at least minimize exposure while you sort through all of this.

② Will the level go down below 10 ppb?

③ What ~~will~~ be NOAEL / LOAEL?

④ How did we the qualified parties & people who say they have been exposed?

⑤ What about liability issues?

Before more people leave,
Would it be acceptable to ask if any
individuals from
Arizona — would be interested in
speaking with me ^{about the potential} to set up
internship opportunities for my toxicology
students.

^{Kaiser Medville}
~~Please~~ ~~See me~~ before they leave
(the students are provided to work
FREE & do whatever they are assigned by
the internship
provider.)

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PRESENTATIONS ARE HIGHLY COMMENDABLE! HOWEVER,
THE
WITH ^{KNOWN TOXICOLOGICAL} EFFECTS FROM PERCHLORATE AND
WITH KNOWN AREAS WHERE PERCHLORATE WATER WAS
CONSUMED FOR MANY YEARS, WHY ARE THE EPIDEMIOLOGISTS
NOT INVOLVED IN THIS ^{TOXICOLOGICAL} PROCESS. IT WOULD APPEAR
THAT IF PERCHLORATE IS A PROBLEM, THEN EPIDEMIOLOGICAL
STUDIES SHOULD BARE THIS TO BE TRUE.

(4) Will introducing nitrogen to
crops - would proliferate vector
and/or breakdown? (Eco)

(5) Peer 6. - Comment - (Eco)
Eco assessment will be
included in external peer
review

(6) Large reservoir stratified low
levels (anaerobic condition) -
will this accelerate ~~formation~~
breakdown? ^{into acids}
↓
formation of tri-
ethyl methanes.

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Annie,

How could possibly the uncertainty factor of 100 be realistic? In engineering factor of 10 is considered way too conservative. Is this 100 a normal accepted practice?!

⑦ Any reactions to perchlorate and seawater?

⑧ ~~Down~~ 200 °C. - what is source of that information? I have something ~~that~~ that ranges 300 °C.

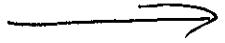
⑨ Can you see perchlorate with samples that are high TDS?

⑩

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~~Handwritten~~
Are any epidemiological studies being planned to
look at T₃ T₄ levels in newborns (through newborn
screening) in exposed populations in Las Vegas/
~~Southern California~~ & non exposed

(Eco)

① If soil has high
organic content would
salt latch on to
phosphate?

② How do mammal studies inform
eco risk assessment and
studies? (Eco)

③ on agricultural crops - if we go
to higher than 18 ppt for irrigation
is that OK? to prevent
damage to cow crops? (Eco)

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ABOUT ONE YEAR AGO, THE CALIFORNIA DHS
PERCHLORATE ANALYSIS METHOD (AS-5) WAS NOT
READILY BEING ACCEPTED AS A VALID PROCEDURE.
IS THE METHOD BECOMING RECOGNIZED AND
THUSLY, A VALID METHOD FOR MEASURING
PERCHLORATE TO THE 4MG/L LEVEL?

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How is RELIABLE INFORMATION ON PERCHLORATE LEVELS IN DRINKING WATER SYSTEMS IN CA AND NEV OBTAINED? ARE WATER SYSTEMS "REQUIRED" TO REPORT THESE LEVELS. How DOES THIS DIFFER BETWEEN CA & NEV. ARE LEVELS REPORTED IN NEV - CALIFORNIA - VOLUNTARY REPORTS?

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We have vast Superfund + WQARF sites that have no real progress ^{towards} ~~themselves~~ cleanup, even after consent decrees. The ADEQ still has never identified PRPs for most sites, after a decade. The "cleanups" of these sites will take hundreds of years at this rate. Why would anyone expect this perchlorate contamination to be cleaned up within our lifetime?

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IN REFERENCE TO KENT T. STATEMENTS

REGARDING THE USE OF INTERIM HEALTH STANDARD OF
1.8 PPB CLO₄⁻ IN CA & NEV. IS THE STANDARD
BASED IN LAW, STATUTE, ADMIN. RULE, POLICY, etc.

How is the standard enforced and by whom?

I WAS NOT AWARE THAT THIS "STANDARD" EXISTED
IN NEVADA. IS THIS SUGGESTED OR VOLUNTARY
IN NV?

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Nothing presented indicates that exposure through ^{inhalation,} skin absorption, ^{Showering,} bathing, ^{swimming,} food chain (eating Colorado River fish), which would be potentially as much or more than drinking the perchlorates, has been ^{considered} adequately included in determining ^{dosage +} exposure. Also, ^{the} synergistic effects of the other hundreds of chemicals we are exposed to daily are not considered. How can this be called "scientific?"

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Have there been any adverse health affects
sound in the workers employed at the perchlorate
manufacturing plants?
Since perchlorate appears to already be in some
drinking water sources, has anyone examined
the health effects in the people using these
sources?

✓

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- A.) Does Perchlorate have any effects to "enhance" health effect concerns with "mixed" exposures of other identified contaminants of known "EPA Superfund" or "State WQARE" sites? = "Synergistic" & Accumulative
- B.) Or "mask" or be "masked" for proper scientific identification / neurotoxicity? genotoxicity?

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① ~~How~~ Has the DoD offered any funding to assist in the monitoring of ground & surface H₂O off "off site" of the military facilities?

② Has the "Sampling Group" ~~look at~~ also monitored for TCE/PCE/Metals and other chemicals related to these facilities, if not, why?

- hot water
 - insects due to hot water
bacteria to children
 - Compromised immune systems
- dementia, lupus etc
-